

HAMID S. ATIYYAH

The Structuring of Branches

A Test of Formal Organization Theory at Subunit Level in a Developing Country

Formal organization theory has been tested in a variety of organizations such as manufacturing firms (Pondy, 1969; Rushing, 1967; Warner, 1967; Child, 1973), hospitals and schools (Terrien and Mills, 1955; Anderson and Warkov, 1961; Holdaway and Blowers, 1971; Hendershot and James, 1972), and service organizations (Blau and Schoenherr, 1971). Few studies (Comstock and Scott, 1977; Daft and Bradshaw, 1980; Herbiniak and Alutto, 1980), however, have investigated this theory at the subunit level. Also, few attempts (Lammers and Hickson, 1979; Badran and Hinings, 1981; Marsh and Mannari, 1981; Birnbaum and Wong, 1985) have been made to ascertain whether or not this theory, which has been conceived and repeatedly tested in Western industrialized countries, is universally valid. The main objective of this study is to investigate the validity of formal organization theory by investigating a different organizational set—namely, municipal branches—in a developing country—namely, Saudi Arabia.

Previous research

The association between size and structure and the predictive power of size versus technology and other contextual variables have been major topics for research among students of organization. Although these studies have contributed valuable insights on how organizations are structured, they have been criticized for failing to develop adequate theoretical justification for many hypotheses tested and dimensions

measures. Often, justification follows rather than precedes hypothesizing. There are also disagreements among researchers following the structuralist perspective on important issues such as how to view and define size conceptually and operationally, the variation of size effects with size level, the presence of a lag between size increase and structural changes, and whether to investigate size effects cross-sectionally or longitudinally. Further research is evidently needed to resolve these differences. For our purposes, we focus on three issues that have not been adequately investigated: the causal relationship between size and structure, the impact of size increase at the subunit level, and the universalism of formal organization theory.

Size and structure

The significance of size as a causal variable has been questioned by a number of researchers (Hall, 1972; Aldrich, 1972; Daft and Bradshaw, 1980; Gooding and Wagner, 1985). The possibility of an inverse association between size and structural properties was raised by Aldrich (1972), who argued that organizations high on complexity and formalization need a larger work force than do less structured organizations. Earlier, Hall (1972) had also suggested that a decision to increase size followed a decision to increase the number of functions. Daft and Bradshaw (1980) also found that a decision to establish a university department was made first, before hiring necessary staff. Similarly, Starbuck (1965) and Hinings and Foster (1973) conceived of growth or size increase as a means of attaining additional goals. Gooding and Wagner (1985) also found that subunits are added not as a result of expanding in size but in order to increase output. All these viewpoints contradict the principal premise of formal organization theory that size increase precedes and determines structural properties. They suggest that size may be either a predictor, a moderator, a covariant, or a consequence of structure.

A more acceptable explanation can be derived from Chandler's (1962) and Child's (1973) structure-follows-strategy model. According to this model, management acting within the context of environmental and situational forces, including the present organization structure and its philosophy, adopts a strategy that decides, among other things, the appropriate organization size. If we apply this line of thinking to our sample of municipal branches, we can see that municipal leaders will

decide to expand existing operation and/or add new activities in response to environmental demand. An increase in the size of municipal branches may become necessary to perform the new services, and new departments and organizational levels are added to a branch structure to accommodate new or expanded functions. Thus, under norms of rationality, management will respond to environmental demands by increasing a branch's scale of operations—that is, its size—and by differentiating its structure. To test this proposition, situational variables that are expected to influence management choice of a branch size are first identified, and then a number of hypotheses are presented describing the expected relationships between these situational variables and branch size, and between size and branch structure.

Size effect at the subunit level

As mentioned earlier, little effort has been devoted to studying formal organization theory at the subunit level. Balu and Schoenherr (1971) reported a strong association between subunit size and differentiation. Herbiniak and Alutto (1980) found that some aspects of subunit structure vary with subunit size. However, results obtained by Comstock and Scott (1977) indicate that technology, rather than size, is the major determinant of subunit structure. Daft and Bradshaw (1980) argued that the effect of size on structural differentiation is moderated by the type of department. Moreover, since the nonlinear association between organization size and size of staff subunits reported by most researchers indicates that subunit size increases disproportionately, it follows that subunit differentiation must also vary. Obviously, there is need for further investigation of the effects of size and the process of structural differentiation at the subunit or branch level.

Cultural constraints

The possibility that culture will impose constraints on structure, and thus confound size effects, must also be entertained. Most of the few studies focusing on this aspect (Badran and Hinings, 1981; Conaty, Mahmoudi, and Miller, 1983; Birnbaum and Wong, 1985) report that structure varies independently of culture. However, with regard to our research sample of municipal branches in Saudi Arabia, cultural influences on the research variables cannot be ruled out. In Saudi public

organizations, managers regard the number of their subordinates as a symbol of their status (Atiyyah, 1988); thus, subunit size may not be totally explained by rational criteria such as the demand for its services. Downs (1967) and Kimberly (1976) believe that this is also true of public organizations in developed countries. Furthermore, the creation of new subunits in Saudi public organizations may be motivated by the need to create management positions to which employees can be promoted. As a result, inconsistencies are observed sometimes between a subunit's design (i.e., division, department, or section) and its size and level of operation. For example, a division may be found to have fewer employees and contribute lesser services than a department within the same public agency. Unfortunately, testing for cultural effects is extremely difficult since managers are unlikely to admit that their decisions on size and structure are influenced by consideration of personal prestige and fulfillment of socially imposed obligations toward family and tribal members as well as work associates.

Research hypotheses

Size and demands for services

Successful businesspeople have for centuries used their profit-making acumen and market information to decide whether to meet existing and predicted demand by producing and selling more goods and services. Similarly, managers of public organizations consider satisfying demand for their services their *raison d'être* or—instrumentally—as justification for expanding their operations. Accordingly, demand for services in the locality served by a municipal branch is expected to influence management's decisions regarding branch size. Three variables are identified here to represent demand for services: population of the serviced area, serviced area, and distance between branch and head offices (HO).

Demand for municipal services such as water, sewage, public health, and sanitation is strongly related to population size. Population size has often been used by researchers as an indicator of potential clientele. Accordingly, organization size is expected to vary with population size. Blau and Schoenherr (1971) argued that the size of employment security agencies, in their research sample, was dependent on population serviced. Klatzky (1970) reported a high correlation (0.95)

between state population and size of state employment agencies. Christenson and Sachs (1980) found a strong association between the number of employees of state agencies and population. Ammons (1983) reported that municipal managers supported their requests for additional employees by referring to ratios of municipal workers to 10,000 population in different cities. The ratio of pupil-teacher is often used by educational institutions for the same purpose. To sum up, it is likely that the size of a branch serving a larger population will be greater than that serving a smaller population.

Some municipal activities, such as land preservation, roads, sanitation, and maintenance, are sensitive to the area of the locality served. Hall, Haas, and Johnson (1967) argued that spatial dispersion influences size. Noell (1974) used land area as a measure of the scale of operation of American states. Accordingly, the size of a branch is expected to vary with the area served. Finally, it can be argued that the size of a branch is influenced by its distance from the home office. Branches farthest from the home office are expected to be larger. Unless these distant branches have enough labor power to provide full and fast services to the local population, clients will have to travel the long distance to the home office to obtain service. On the other hand, branches nearest to the home office may have fewer employees as a result of the consolidation of some of the services at the home office. The following hypotheses can now be suggested:

1. *Branch size will be positively associated with the size of the population it serves.*
2. *Branch size will be positively associated with the area it services.*
3. *The greater the distance between a branch and its head offices, the greater will be the branch's size.*

The direct effect of these variables representing demand for services on branch structure is also investigated. However, since previous research has not considered this possibility, our interest in it is merely exploratory.

Size and differentiation

The general consensus among most researchers following the structuralist perspective (Pugh et al., 1969; Blau, 1972; Child, 1972; Meyer, 1972; Dewar and Hagg, 1978; Agarwal, 1979; Miller and Conaty,

1980) is that increased size leads to increased differentiation both horizontally and vertically. When new activities are added, more specialists are hired, increasing the need for control and coordination. New departments may be created, and since the span of control cannot be increased beyond a reasonable limit, the number of levels will be increased eventually. Results obtained at the subunit level of analysis also confirm this (Blau and Schoenherr, 1971; Comstock and Scott, 1977; Herbiniak and Alutto, 1980). With regard to cultural impact on size-structure association, most research findings support a culture-free relationship. However, field observations on the Saudi bureaucracy indicate the presence of a general empire-building tendency and the creation of departments for the purpose of providing promotion opportunities, which may have a confounding effect on the size-differentiation relationship. The following hypothesis can now be suggested:

4. *As branch size is increased, horizontal and vertical differentiation of its structure will also increase.*

Size and span of control

Most researchers report a positive association between size and span of control of the chief executive. Dewar and Hage (1978) argue that greater differentiation resulting from increased size will also lead to a wider span. However, Blau and Schoenherr (1971) suggested that management generally prefers vertical differentiation rather than an excessively wide span of control, which increases their work load. A wider span of control is also favored by subordinates who may feel that reporting to the chief executive will enhance their prestige and power positions within the organization. Accordingly, the expected cultural impact is congruent with size effect. Hence, the following hypothesis:

5. *As branch size increases, the span of control of the branch manager also increases.*

Size and administrative component

The relationship between size and the number or ratio of administrative staff to total number of personnel (the administrative component) has been widely studied. Few researchers have found either a positive or no association between size and the administrative component. Most

researchers report that increased size is followed by a decrease in the ratio of number of administrative personnel. Some researchers (Child, 1973; Reimann, 1973; Ford, 1980) observe that this result has been predominantly found in research on service organizations. Bureaucratic pressures of the nature suggested by Parkinson's law are evident in Saudi public organizations. Managers of personnel and budget departments acquire considerable influence from the control they formally exercise over budgetary and personnel matters. They are often accused of exploiting this influence to increase the number of their subordinates. It is also alleged that the acquiescence of line managers is secured in return for a favorable interpretation and application of laws regarding personnel and financial matters. This bureaucratic arrangement may result in a smaller negative correlation between size and the administrative component. Hence, our next hypothesis:

6. *As branch size increases, the ratio of administrative staff decreases.*

Size and performance

Consensus on the relationship between size and performance is lacking. Blau (1970) observed that economy of scale decreases with increasing size. Dalton et al. (1980) reported that results on this relationship at the subunit level of analysis are generally inconclusive, but there is more evidence of a negative association. Traditionally, local governments have been reformed on the basis of the view that effectiveness and efficiency are best served by a few large units (Christenson and Sachs, 1980). Ostrom (1972), on the other hand, contends that the opposite—that is, more and smaller units—is better.

A meta-analysis conducted by Gooding and Wagner (1985) showed a negative or no association between subunit size and performance. In explaining this result, they called attention to the "free-riding" behavior that goes undetected in large groups and the cost of coordination. Widespread free-riding behavior is characteristic of large public organizations in developing countries where lax supervision and low objectivity stemming from strong kinship and friendship ties and other cultural traits foster indifference to performance standards and work ethics. Indeed, if increased size leads to overcrowding rather than differentiation, then lower output can be expected. However, because of the paucity of available evidence on the association between size and

performance and differentiation and performance at the subunit level, our interest in these aspects is exploratory.

Methodology

Sample

The research sample included seventy-one organizational subunits that are branches of the six major municipalities in Saudi Arabia. This Arab country is known for its vast oil reserves and financial wealth. It is sparsely populated and employs a large number of foreign laborers in its public and private sectors. Organizational subunits in the sample share a common political, legal, and social environment. Rules and regulations governing municipal activities are centrally promulgated by the Ministry of Municipal and Rural Affairs; hence, the degree of formalization and standardization is the same for all municipalities.

Opinions differ on whether a single-industry or a multiple-industry sample should be used in such studies. The choice of a single-industry sample, however, controls for the possible effect of work technology.

Municipal branches included in the sample ranged in size from a minimum of 10 to a maximum of 523 employees, with an average size of approximately 162 employees. Most of the branches are located within a short distance from head offices, but a few operate outside city limits.

Measurement

Data for this research were obtained from archives, official records, organizational charts, manuals and yearbooks, and interviews with senior managers. The use of institutional measures in measuring research variables has clear advantages over questionnaire measures, especially in developing countries where respondents are less than candid and response bias is high.

Factual data on population and area serviced and distance from head offices were obtained from official records and authenticated by senior officials in head offices. Like most researchers, we measured size by the number of personnel employed by a branch and used its log transformation in the analysis. Christenson and Sachs (1980) argued that the use of this measure of size in research on public service organizations is justified by the labor-intensive nature of such organizations. The size

of the administrative component was measured by the ratio of the number of employees in administrative subunits (personnel, accounting, mail, and filing) and administrative and clerical employees in line departments (park and recreation, sanitation, water, health inspection, zoning) to the total number of personnel.

Horizontal differentiation was measured by the count of subunits within a branch's structure, while vertical differentiation was measured by the number of levels from the lowest to the highest position in a branch's hierarchy.

There is a lack of consensus among researchers about how to measure the performance of public service organizations. Glisson and Martin (1980) measured productivity by a ratio of the number of clients served per week per line worker. Gooding and Wagner (1985) used the absolute number of clients served as a measure of productivity. Unfortunately, none of the municipalities in the sample kept records of the number of clients served. Instead, the number of completed transactions in 1986 was used as a convenient measure of branch output or performance. However, this statistic was not available for all branches in the sample. For this reason, and because of other difficulties encountered in data collection, some of the results were obtained using data from a smaller sample.

Results

Table 1 presents the Pearson product-moment correlations, means, and standard deviations of the research variables. Correlations between size and population and area served and distance from head offices are either insignificant or contrary to predictions. The moderately low correlation between size and population is inconsistent with the view that these two are interchangeable measures of organization size (e.g., Robey, Bakr, and Miller, 1977).

Despite their common technology, municipal branches showed wide variations in their structural properties. Size is significantly correlated with only one of these properties—namely, the administrative component. In contrast, population, which some researchers consider a measure of potential clientele, is strongly correlated with vertical differentiation, and the size of the administrative staff as well as output. Output is also associated with two of the structural variables: horizontal differentiation and the branch manager's span of control.

Table 1
Means, standard deviations, and intercorrelations for all variables

Variables	Means	S.D.	1	2	3	4	5	6	7	8	9	10	11
1. Size	160.6	144.19	—	—	—	—	—	—	—	—	—	—	—
2. Log-size	2.03	0.39	—	—	—	—	—	—	—	—	—	—	—
3. Serviced population	68,889.67	58,256.5	07	14	—	—	—	—	—	—	—	—	—
4. Serviced area	38.64	42.28	-28*	-15	-11	—	—	—	—	—	—	—	—
5. Distance from head office	13.72	16.68	-25*	-33*	-27*	00	—	—	—	—	—	—	—
6. Horizontal differentiation	15.55	7.69	05	18	24	16	-27*	—	—	—	—	—	—
7. Vertical differentiation	3.18	.68	-03	14	30**	20	-23	61***	—	—	—	—	—
8. Number of administrative personnel	21.57	10.44	38**	47**	45**	00	-24	28*	14	—	—	—	—
9. Administrative component (ratio to total size)	0.21	0.25	-66***	-76***	11	06	20	-01	-12	—	—	—	—
10. Span of control	4.55	2.43	0.09	-01	12	01	-05	15	02	12	07	—	—
11. Performance	1,281.75	1,671.88	00	14	44**	00	-21	67***	15	33	17	49**	—

^a Decimal points omitted.

* $p = 0.05$; ** $p = 0.01$; *** $p = 0.001$.

To test the hypothesized relationships between variables in the research, a number of stepwise regression analyses were run. The results are summarized in Table 2. Only distance from head offices and area served entered the regression for size as the dependent variable. Distance from head offices was found to have some influence on size. The results also indicate that horizontal differentiation was not predicted by size, area, or population served, while the influence of distance from head offices was very small. The predicted effect of size on vertical differentiation was not supported by the regression results, and only minor effects were detected for population and area. Also, span of control of the branch manager was influenced neither by size nor by the hypothesized determinants of size.

Regression results for the administrative component as a dependent variable support size as the major predictor, and explain a great proportion of its variance, followed by population. The strong association with size confirms results of most previous studies. This also raises the question of why other size effects reported in these studies did not show up here.

Finally, performance was regressed on size as well as structural variables in the study. The results indicate that horizontal differentiation has the greatest impact on performance.

Discussion and conclusion

The research results obtained here do not suggest an adequate explanation of the size of municipal branches. Only distance from head offices appears to have some influence on size, but contrary to predictions, branches closer to head offices have larger labor forces. One possible explanation for this is that, during office and business hours, the population served by these branches is increased considerably by the influx of employees and shoppers; and in the holy cities of Mecca and Medina, central districts are daily frequented by large numbers of worshippers. Another explanation is suggested by Freeman's (1979) observation that the size of some public organizations is decided by budgetary appropriations. Branch managers compete for a limited number of personnel approved in the municipality's budget. In order to increase his share of personnel, a branch manager must use all of his influence with his superiors at head offices. Perhaps branch managers close to head offices develop closer friendships with their superiors,

Table 2
Results of hierarchical regression analyses of the effect of variables on size, structure, and output

Dependent variable	D	Step	Independent variable	Betas	Incremental R^2	F	p
Size	71	1	Distance from head office	-0.34	0.114	8.893	0.00
		2	Area	-0.18	0.035	2.797	0.09
		Cumulative $R = 0.149$, $F = 5.96$, $p = 0.01$					
Horizontal differentiation	59	1	Distance from head office	-0.026	0.078	4.82	0.03
Vertical differentiation	59	1	Population	0.29	0.092	5.81	0.01
			Area	0.23	0.947	3.04	0.08
		Cumulative $R = 0.139$, $F = 4.53$, $p = 0.01$					
Administrative component	59	1	Size	-0.8	0.578	78.12	0.00
		2	Population	0.19	0.046	6.95	0.01
		Cumulative $R = 0.624$, $F = 46.62$, $p = 0.00$					
Performance	24	1	Horizontal	0.71	0.451	18.1	0.00

and this enables them to exercise more influence to expand size. Under such conditions, the assumption of rationality in the situation would not hold firmly (Child, 1972).

Size and population were both related to the administrative component. In conformity with previous research findings, size emerged as the major predictor. The positive association between population and administrative component is difficult to explain since these employees do not participate directly in providing service.

More important, and contrary to findings widely reported in the literature, size was not related to structural differentiation. Three tentative explanations can be suggested here. First, in sparsely populated countries engaged in a process of rapid development and modernization, increasing demand for services may create strong pressures for the elaboration of structure, regardless of size. Management learns from lessons of experience (a feedback loop) that by increasing differentiation—without necessarily increasing size—output can be increased. Once the utility of this heuristic principle is proven, others will copy it.

The second explanation is based on observed characteristics of Saudi Arabian culture. Differentiation grants employees status and relative independence by creating subunits around them. While this may be done for purely social reasons, its impact on performance is also favorable. Bedouin Arabs, who constitute the dominant group within Saudi public organizations, are primarily interested in distinguishing themselves in terms of social (nonproductive) values such as prestige, power, rank, and status. The advent of oil wealth and bureaucratization brought forth a different set of symbols of distinction: number of mansions, number of household servants, and the like. Yet, the bedouin's ideal remains unchanged (i.e., to establish a domain of his own—be it a multibillion-dollar commercial venture or a grocery store—where he can attain his cherished goals). He has not yet accepted the terms of employment in large organized groups, least of all subordination and obedience to bureaucratic authority. His dissatisfaction with his status as a subordinate motivates him continuously to seek increments to his status and power within the organization. If this cannot be achieved through promotion, which is fiercely competitive, he may be content with a lateral change in his position from a state of greater dependency and low prestige as a subordinate in a large group to a state of lesser dependency as a subordinate in a smaller group—or preferably as its acting head. He is then obliged to reciprocate the favor of his benefactor (i.e., the organization manager) by greater loyalty and even greater productivity. This is clearly illustrated in the case of the municipality manager who declared that, as a reward for the excellent performance of one of his employees, he unofficially created a new section and put the employee in charge of it under his direct supervision. Although this employee did not get a promotion and his salary was unchanged, his new position was regarded as a significant reward.

Whether differentiation is introduced for social reasons or as a deliberate measure to increase output, it is the management aspiration and not size or technology imperatives that determines structure. And although the discretionary authority of municipal managers is constrained by budgetary appropriation, they could still exercise some degree of choice in designing structure. In view of this, a better understanding of the process of designing structure and the critical factors involved in it can be reached by asking managers to describe how they actually structure their organizations. As Robey, Bakr, and Miller

(1977) suggested, organization theory could probably be enriched by the wisdom of the practitioner.

References

- Agarwal, Naresh, C. "Nature of Size-Structure Relationship: Some Further Evidence." *Human Relations*, 32 (1979), 441-450.
- Aldrich, Howard E. "Technology and Organizational Structure: A Re-examination of the Findings of the Aston Group." *Administrative Science Quarterly*, 17 (1972), 26-43.
- Ammons, David N. *Municipal Productivity: A Comparison of Fourteen High-Quality-Service Cities*. New York: Praeger, 1983.
- Anderson, Theodore R., and Warkov, Seymour. "Organizational Size and Functional Complexity: A Study of Differentiation in Hospitals." *American Sociological Review*, 26 (1961), 23-28.
- Atiyyah, Hamid S. "Computer Impact on Management and Organization in Saudi Arabian Public Bureaucracy." *Organization Studies*, 9 (1988).
- Badran, Mohamed, and Hinings, Robert. "Strategies of Administrative Control and Contextual Constraints in Less-Developed Countries: The Case of Egyptian Public Enterprise." *Organization Studies*, 2 (1981), 3-21.
- Birnbaum, Philip H., and Wong, Gilbert Y. "Organizational Structure of Multinational Banks in Hong Kong from a Culture-free Perspective." *Administrative Science Quarterly*, 30 (1985), 262-277.
- Blau, Peter M. "A Formal Theory of Differentiation in Organizations." *American Sociological Review*, 35 (1970), 201-218.
- . "Interdependence and Hierarchy in Organizations." *Social Science Research*, 1 (1972), 1-24.
- Blau, Peter M., and Schoenherr, Richard. *The Structure of Organizations*. New York: Basic Books, 1971.
- Chandler, Alfred D. *Strategy and Structure*. New York: Doubleday, 1962.
- Child, John. "Organizational Structure, Environment and Performance: The Role of Strategic Choice." *Sociology*, 6 (1972), 2-22.
- . "Parkinson's Progress: Accounting for the Number of Specialists in Organizations." *Administrative Science Quarterly*, 17 (1973), 163-177.
- Christenson, James A., and Sachs, Carolyn E. "The Impact of Government Size and Number of Administrative Units on the Quality of Public Services." *Administrative Science Quarterly*, 25 (1980), 89-101.
- Comstock, Donald E., and Scott, W. Richard. "Technology and the Structure of Subunits: Distinguishing Individual and Work Group Effects." *Administrative Science Quarterly*, 22 (1977), 177-202.
- Conaty, Joseph; Mahmoudi, Hoda; and Miller, George A. "Social Structure and Bureaucracy: A Comparison of Organizations in the United States and Pre-revolutionary Iran." *Organization Studies*, 4 (1983), 105-128.
- Daft, Richard L., and Bradshaw, Patricia J. "The Process of Horizontal Differentiation: Two Models." *Administrative Science Quarterly*, 25 (1980), 441-456.
- Dalton, Dan R.; Todor, William D.; Spendolini, Michael J.; Fielding, Gordon J.; and Porter, Lyman W. "Organization Structure and Performance: A Critical Review." *Academy of Management Review*, 5 (1980), 49-64.
- Dewar, Robert, and Hage, Jerald. "Size, Technology, Complexity, and Structural Differentiation: Toward a Theoretical Synthesis." *Administrative Science Quarterly*, 23 (1978), 111-135.
- Downs, Anthony. *Inside Bureaucracy*. Boston: Little, Brown, 1967.
- Ford, Jeffrey D. "The Administrative Component in Growing and Declining Organizations: A Longitudinal Analysis." *Academy of Management Journal*, 23 (1980), 615-630.
- Freeman, John H. "Going to the Well: School District Administrative Intensity and Environmental Constraints." *Administrative Science Quarterly*, 24 (1979), 113-119.
- Glisson, Charles A., and Martin, Patricia Yancey. "Productivity and Efficiency in Human Service Organizations as Related to Structure, Size, and Age." *Academy of Management Journal*, 23 (1980), 21-37.
- Gooding, Richard Z., and Wagner, John A., III. "A Meta-analytic Relationship between Size and Performance: The Productivity and Efficiency of Organizations and Their Subunits." *Administrative Science Quarterly*, 30 (1985), 462-481.
- Hall, Richard H. *Organizations, Structure and Process*. Englewood Cliffs, NJ: Prentice-Hall, 1972.
- Hall, Richard H.; Haas, J. Eugene; and Johnson, Norman J. "Organizational Size, Complexity and Formalization." *American Sociological Review*, 32 (1967), 903-912.
- Hendershot, Gary E., and James, Thomas F. "Size and Growth as Determinants of Administrative-Production Ratios in Organizations." *American Sociological Review*, 37 (1972), 149-153.
- Herbiniak, Lawrence G., and Alutto, Joseph A. "A Comparative Organizational Study of Performances and Size Correlates in Inpatient Psychiatric Departments." *Administrative Science Quarterly*, 25 (1980), 365-382.
- Hinings, C. Robin, and Foster, Bruce D. "The Organization Structure of Churches: A Preliminary Model." *Sociology*, 7 (1973), 93-106.
- Holdaway, Edward A., and Blowers, Thomas A. "Administrative Ratios and Organizational Size, a Longitudinal Examination." *American Sociological Review*, 36 (1971), 278-286.
- Kimberly, John R. "Organizational Size and the Structuralist Perspective: A Review, Critique, and Proposal." *Administrative Science Quarterly*, 21 (1976), 571-597.
- Klatzky, S. "Relationship of Organizational Size to Complexity and Coordination." *Administrative Science Quarterly* (December 1970), 428-458.
- Lammers, Comelis J., and Hickson, David J., eds. *Organizational Alike and Unlike: International and Inter-institutional Studies in the Sociology of Organization*. London: Routledge and Kegan Paul, 1979.
- Marsh, Robert M., and Mannari, Hiroshi. "Technology and Size as Determinants of the Organizational Structure of Japanese Factories." *Administrative Science Quarterly*, 26 (1981), 33-57.
- Miller, George A., and Conaty, Joseph. "Differentiation in Organizations: Replication and Cumulation." *Social Forces*, 59 (1980), 265-274.
- Meyer, Marshall W. "Size and the Structure of Organizations: A Causal Model."

- American Sociological Review*, 37 (1972), 434-441.
- Noell, James J. "On the Administrative Sector of Social Systems: An Analysis of the Size and Complexity of Government Bureaucracies in the American States." *Social Forces*, 52 (1974), 549-558.
- Ostrom, Elinor. "Metropolitan Reform: Propositions Derived from Two Traditions." *Social Science Quarterly*, 53 (1972), 474-493.
- Pondy, Louis R. "Effects of Size, Complexity, and Ownership on Administrative Intensity." *Administrative Science Quarterly*, 14 (1969), 47-60.
- Pugh, Derek S.; Hickson, David J.; Hinings, C.R.; and Turner, C. "The Context of Organizational Structure." *Administrative Science Quarterly*, 14 (1969), 91-114.
- Reimann, Bernard C. "On the Dimensions of Bureaucratic Structure: An Empirical Reappraisal." *Administrative Science Quarterly*, 18 (1973), 462-476.
- Robey, Daniel; Bakr, M.M.; and Miller, Thomas. "Organizational Size and Management Autonomy: Some Structural Discontinuities." *Academy of Management Journal*, 20 (1977), 378-397.
- Rushing, William A. "The Effects of Industry Size and Division of Labor on Administration." *Administrative Science Quarterly*, 12 (1967), 273-295.
- Starbuck, William H. "Organizational Growth and Development." In James G. March (ed.), *Handbook of Organization*. Chicago: Rand McNally, 1965.
- Terrien, Frederick W., and Mills, Donald L. "The Effect of Changing Size upon the Internal Structure of Organizations." *American Sociological Review*, 20 (1955), 11-13.
- Warner, W. Lloyd, ed. "The Emergent Society." *Large Scale Organizations*, vol. 1. New Haven, CT: Yale University Press, 1967.